

1. Solve the following system algebraically:

$$x - 2y + 3z = 9$$

$$-x + 3y = -4$$

$$2x - 5y + 5z = 17$$

Using ① + ② Eliminate x

$$\begin{array}{r} \textcircled{1} \quad x - 2y + 3z = 9 \\ \textcircled{2} \quad -x + 3y = -4 \\ \hline \textcircled{4} \quad 1y + 3z = 5 \end{array}$$

Using ③ + ② Eliminate x

$$\begin{array}{r} \textcircled{2} \quad 2(-x + 3y = -4) \\ \textcircled{3} \quad 2x - 5y + 5z = 17 \\ \hline \textcircled{5} \quad y + 5z = 9 \end{array}$$

Using ④ AND ⑤ Eliminate y

$$\begin{array}{r} \textcircled{4} \quad -(1y + 3z = 5) \\ \textcircled{5} \quad 1y + 5z = 9 \\ \hline \textcircled{4} \quad -1y - 3z = -5 \\ \textcircled{5} \quad 1y + 5z = 9 \\ \hline 2z = 4 \\ \frac{2z}{2} = \frac{4}{2} \end{array}$$

$$\boxed{z = 2}$$

Find y using ④ or ⑤

$$1y + 3(2) = 5$$

$$\begin{array}{r} 1y + 6 = 5 \\ -6 \quad -6 \\ \hline y = -1 \end{array}$$

$$\boxed{(1, -1, 2)}$$

Find x using ① or ② or ③

$$x - 2(-1) + 3(2) = 9$$

$$x + 2 + 6 = 9$$

$$x + 8 = 9$$

$$\boxed{x = 1}$$

$$\begin{array}{l} 3x - 2y + 4z = 1 \quad \textcircled{1} \\ 1. \quad x + y - 2z = 3 \quad \textcircled{2} \\ 2x - 3y + 6z = 8 \quad \textcircled{3} \end{array}$$

Using 1 and 2 eliminate x

$$\begin{array}{r} \textcircled{1} \quad 3x - 2y + 4z = 1 \\ \textcircled{2} \quad -3(x + y - 2z = 3) \quad \oplus \\ \hline \textcircled{4} \quad -5y + 10z = -8 \end{array}$$

Using 2 and 3 eliminate x.

$$\begin{array}{r} \textcircled{2} \quad -2(x + y - 2z = 3) \\ \textcircled{3} \quad 2x - 3y + 6z = 8 \quad \oplus \\ \hline \textcircled{5} \quad -5y + 10z = 2 \end{array}$$

Using ④ and ⑤ eliminate y

$$\begin{array}{r} \textcircled{4} \quad -(-5y + 10z = -8) \\ \textcircled{5} \quad -5y + 10z = 2 \quad \Rightarrow \oplus \\ \hline 0 = 10 \\ \text{False} \end{array}$$

No Solution!